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HEALTH LITERACY AND PRE-ECLAMPSIA KNOWLEDGE OF PREGNANT MOTHERS ATTENDING PRIMARY HEALTH CARE CENTERS IN IKENNE LOCAL GOVERNMENT, OGUN STATE

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ABSTRACT: ***Background:*** *Pre-eclampsia continues to be a major public health issue of concern in both developed and developing countries, contributing to maternal and neonatal morbidity and death globally. This study examined the health literacy and preeclampsia knowledge of pregnant mothers attending primary health care centers in Ikenne Local government, Ogun State.* ***Methodology:*** *A cross-sectional research design was conducted among pregnant women attending selected health facilities in Ikenne Local Government Area of Ogun State, using an interview-administered semi-structured questionnaire, validated with Cronbach's alpha internal consistency coefficients ranging from 0.76-0.90. The computed sample size for this study was 380 in which there was a 90% response rate. Data was analyzed with IBM Statistical Product and Service Solution (SPSS) version 23.* ***Results:*** *The mean age (SE) of the women in the study was 28.21 years. Majority of the participants (75.4%) had a high literacy level. Majority of the participants (65.1%) had a low knowledge score (12.34 ± 3.27). There was a significant relationship between health literacy and knowledge of pre-eclampsia ($r = 0.175$; $r^2 = 0.350$; $p = 0.01$) among the participants of this study, and health-seeking behaviors to pre-eclampsia has a statistically significant relationship with health literacy of the women ($r = 0.182$; $r^2 = 0.033$; $p = 0.0001$).* ***Conclusion:*** *Findings of the study highlight important predictors of health-seeking behaviors among pregnant women. Health seeking behaviors are predicted by knowledge, health literacy and diagnosis of pre-eclampsia. As a result, it is critical for healthcare providers to ensure that women understand the information they are provided about their health.*

KEYWORDS: Pre-eclampsia, Health-seeking behavior, Health Literacy.

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INTRODUCTION

Pre-eclampsia continues to be a major public health issue of concern in both developed and developing countries, contributing to maternal and neonatal morbidity and death across the world. Pre-eclampsia is one of the leading causes of maternal mortality worldwide (Fondjo, Boamah, Fierti, Gyesi & Owiredu, 2019). Approximately 2% to 8% of pregnancies are affected by pre-eclampsia, defined by the development of hypertension and proteinuria after 20 weeks of gestation (Henderson, Thompson, Burda & Cantor, 2017). In developing countries, such as in Africa, the prevalence of pre-eclampsia ranges from 1.8 to 16.7% (Belay & Wudad, 2019). Pre-eclampsia, for example, affects 10% of African women's pregnancies, which is substantially higher than the global average of 2% (Belay & Wudad, 2019). Pre-eclampsia/eclampsia is one of the four major causes of maternal mortality in the United States, along with hemorrhage, cardiovascular disease, and thromboembolism (Collier & Molina, 2019). The incidence of hypertensive disorders of pregnancy (gestational hypertension, pre-eclampsia, and eclampsia) has increased over the last two decades, from 57.3 per 1000 delivery hospitalizations in 1994 to 86.5 per 1000 delivery hospitalizations in 2013 (Harper, Tita & Karunmanchi, 2020).

Unlike maternal deaths due to other direct causes, pre-eclampsia/eclampsia related deaths appear to be increasing and remain a major problem both in maternal and infant morbidity and mortality. Pre-eclampsia is the leading cause of maternal and perinatal morbidity and mortality worldwide. Both women and their newborns are at risk of severe morbidity, long-term impairment, and death. Maternal mortality is considerably more likely in areas where pregnant women do not have access to basic prenatal and postpartum care. The prevalence of pre-eclampsia has continued to be a major challenge in Nigeria and Africa as a whole because unlike other more prevalent causes of maternal mortality (such as hemorrhage and sepsis), medical interventions may be ineffective due to late presentation of cases (Grum, Seifu, Abay, Angesom & Tsegay, 2017).

Pre-eclampsia/eclampsia ranges from about 2% to 16.7%, with approximately 37,000 women dying from this annually in Nigeria (Olaoye, Oyerinde, Elebuji & Ologun, 2019). Pre-eclampsia is reported to be associated with 5.84/1000 births perinatal mortality rate (Makinde, 2012). Another study revealed that hemorrhage and pre-eclampsia/eclampsia make up over 50% of Nigeria's maternal mortality. With strides in preventing hemorrhage-related deaths, hypertensive disorders have become the country’s leading cause of maternal mortality, accounting for 29% of these deaths in tertiary hospitals (Sripad et al., 2019).

A major challenge when it comes to combating pre-eclampsia is the late reporting of pregnant women to healthcare centers following an experience of a sign or symptom. Pre-eclampsia is a disease of signs and symptoms which require prompt attention (Fondjo, Boamah & Fierti, 2019). The more knowledgeable a pregnant woman is about preeclampsia, the more likely she is to recognize and report symptoms to her physicians or seek healthcare. Also, the more her knowledge regarding pre-eclampsia the more she is likely to adhere to self-care behaviors that would help her manage the pre-eclampsia and result in a more positive pregnancy outcome for both the mother and the child.

Therefore, this study seeks to explore the relationship between health literacy and knowledge of pre-eclampsia among pregnant women attending antenatal care clinic in Ikenne Local Government, Ogun State (Olaoye, Oyerinde, Elebuji & Ologun, 2019).

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METHODOLOGY

Study Design

A cross-sectional descriptive survey was selected because it provides an accurate account of the characteristics of the respondents. The study was carried out in Ikenne Local Government Area, one of the existing local council areas in Ogun State, the Southwestern part of the country. This local government is dominated with farming and trading as their major occupation. It has its headquarters seated in Ikenne Remo and comprises 5 major towns which are Iperu, Ilisha, Ogere, Irolu, and Ikenne (Ikenne, 2021). Of all the primary healthcare facilities in each ward of Ikenne Local Government, only five conduct antenatal care services and those five primary health care centers were selected for the study: Ikenne Health Clinic, Ilisan Primary Health Care Centre, Ilisan II Health Clinic, Iperu Health Clinic, and Ogere Primary Health Center. The inclusion criteria included pregnant women with at least two children, pregnant women between ages 18-49, and pregnant women who are and have attended that antenatal clinic more than once.

Research Instrument and Data Collection

The instrument used for data collection was an interview-administered semi-structured questionnaire; the data collection procedure involved the use of trained research assistants who would also read out the questionnaires in English and Yoruba. The health practitioners in the facilities were also partnered with to help mobilize the pregnant women. Incentives were also given to the respondents to ensure their full commitment and appreciate their contribution to the research. Sample size was calculated using the Leslie Kish formula, the computed sample size for this study was 380 in which there was a 90% response rate.

Study Variables

The independent variable in the study is the health literacy of pregnant women. The dependent variable is the health-seeking behavior.

Data Analyses

Data retrieved from this study was analyzed using the version of 23.0 IBM Statistical Product and Service Solution (SPSS). Descriptive statistics and inferential statistics were used to answer the research questions and results were presented in tables, pie and bar charts.

Ethical Clearance

For this study, ethical clearance was obtained from Babcock University Health Research Ethics Committee (BUHREC187/22).

RESULTS

Three hundred and eighty (380) pregnant women were recruited from health facilities in Ikenne Local Government Area, Ogun State. There were three hundred and forty-four eligible responses; thus, the response rate for this study was 90.5%.

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Demographic Characteristics of the Respondents

The socio-demographic characteristics as displayed in Table 1 show that there were 231 (67.2%) women between the ages of 18 and 29 years, which accounted for the highest proportion of women in the age categories in this study. The mean age (SE) of the women in the study was 28.21 years. Also, there were 4 (1.2%) adolescents and 19 (55%) women between the ages 40 and 49 years. Over two-thirds of the women (68.9%) were married while 68 (19.8%) were single and 19 (5.5%) were divorced women. The religious distribution showed that two hundred and twenty-six women (65.7%) were Christians while 115 (33.4%) were Muslims and 3 (0.9%) were affiliated with other religious sects. Sixty-three (18.3%) of the women reported that they had no formal education while 50 (14.5%) had only attained a primary educational certificate and 100 (29.1%) women had a tertiary level degree. Two hundred and forty-two women (70.3%) were from the Yoruba ethnic group; 55 (16%) and 47 (13.7%) were from Igbo and Hausa ethnic groups respectively. Fifty-three women (15.44%) in this study reported to have only one child; 128 (37.2%) had two children and 163 (47.4%) had more than two (see Table 1).

Table 1: Distribution of Respondents' Socio-demographic Characteristics

0	VARIABLES	Frequency (n)	Percentage (%)
1	**Age**		
	18–19 years	4	1.2
	20–29 years	231	67.2
	30–39 years	90	26.2
	40–49 years	19	5.5
	Total	**344**	**100**
	Mean (SE)	**28.21 (0.272) years**	
2	**Marital Status**		
	Married	237	68.9
	Single	68	19.8
	Widow	20	5.8
	Divorced	19	5.5
	Total	**344**	**100**
3	**Religion**		
	Christianity	226	65.7
	Islam	115	33.4
	Others	3	0.9
	Total	**344**	
4	**Ethnicity**		
	Yoruba	242	70.3
	Igbo	55	16
	Hausa	47	13.7
	Total	**344**	**100**
5	**Highest Level of Education**		
	No Formal Education	63	18.3
	Primary	50	14.5
	Secondary	131	38.1
	Tertiary	100	29.1
	Total	**344**	**100**

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6	**Number of Children**		
	One Child	53	15.4
	Two Children	128	37.2
	More than Two Children	163	47.4
	Total	**344**	**100**

Health Literacy of Women

About half of the women in this study stated that they could read better in Yoruba language while 148 (42.4%) selected English and 9 (2.6%) women specified Hausa. When given medications at health facilities, majority of the women (n = 287; 83.4%) stated that they need help to read the instructions regarding when to take the drugs; 268 (77.9%) need help on how to take the medication and 275 women (79.9%) need help to know the clinical purpose of the medication. Two hundred and fifty-one women (73%) however stated that they were able to follow the instructions given without getting confused while 93 (27%) could not.

Being able to understand the instructions on medications does not help (132; 38.4%) women at all because they do not understand; helps 168 (48.8%) women to follow the instructions and gives 44 (12.8%) women control over their health. majority of the women 284 (82.6%) specified that they were able to understand and act on information given to them by health care workers. Regarding other sources of information on health, only 85 (24.7%) women chose packets of goods purchased in the market; 280 (81.4%) and 257 (74.7%) selected friends and leaflets in medicine packets respectively. Other sources of information included media 153 (44.5%).

Level of Health Literacy

Table 2: Level of Respondents' Health Literacy

Health Literacy	Frequency		Measure	Mean	SE	SD
	N	%				
Low (0–6.5)	79	24.6	13 points	7.49	0.092	1.640
High (6.51–13)	242	75.4				
Total	**344**	**100**				

The level of women's health literacy was computed on a 13-point rating scale and the distribution of women across the categories showed that 79 (24.6%) women had low level of health literacy while 242 (75.4%) women scored high points on the health literacy index. The mean (SE) of the women's level of health literacy was 7.49 (0092) with a standard deviation of 1.640.

Knowledge of Respondents on Pre-eclampsia

Majority of the women in this study (269; 78.2%) stated that they were aware of pre-eclampsia. Specifically, only 222 (64.5%) could correctly identify that pre-eclampsia is a condition in which pregnant women have elevated blood pressure, proteinuria and swollen body parts. The distribution of the women's responses to evaluating knowledge of the signs and symptoms of pre-eclampsia showed that 276 (80.2%), 142 (41.3%), 49 (14.2%) and 56 (16.3%) women

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selected severe headaches, confusion, diarrhea and chest pain respectively. In addition, 180 (52.3%) women selected nausea and vomiting, 169 (491%) selected abnormal liver function and 47 (13.7%) selected sore eyes.

The risk factors of pre-eclampsia were assessed and results showed that 105 (30.5%) women believed a previous history of pre-eclampsia to be risk factor. Chronic hypertension (n = 99; 28.8%), renal disease (n = 48.5%), obesity 212 (61.6%), age 228 (66.3%) and family history 98 (28.5%) were identified among other factors. The women identified complications of pre-eclampsia to be preterm birth 213 (61.9%), placental abruption 214 (62.2%), eclampsia 228 (6.3%) and cardiovascular disease 51 (14.6%).

Table 3: Knowledge of Women on Pre-eclampsia

S/N	VARIABLES	Frequency (n=344)	Percentage (%)
1	**Are you aware of pre-eclampsia?**		
	Yes	269	78.2
	No	75	21.8
	Total	**344**	**100**
2	**What is pre-eclampsia?**		
	Pre-eclampsia is a pregnancy complication characterized by high blood pressure, proteinuria and swelling of the hand, feet and face	222	64.5
	Pre-eclampsia is an everyday complication characterized by high blood pressure, proteinuria and swelling of the hand, feet and face	62	23.8
	Pre-eclampsia is the bleeding or abnormal flow of blood from a woman	40	11.8
	Total	**344**	**100**
3	**Which of the following are signs and symptoms of pre-eclampsia?**		
	Severe headache	276	80.2
	Confusion	142	41.3
	Diarrhoea	49	14.2
	Chest pain	56	16.3
	Nausea and Vomiting	180	52.3
	Abnormal kidney function	201	58.4
	Abnormal liver function	169	49.1
	Abdominal pain	93	27
	Sore eyes	47	13.7
	Total	**344**	**100**
4	**What are the risk factors of pre-eclampsia?**		
	Pre-eclampsia in a previous pregnancy	105	30.5
	Chronic hypertension	99	28.8
	Chronic renal disease	167	48.5
	Obesity	212	61.6
	Age >40 years or <18 years	228	66.3
	Diabetes mellitus	117	34
	Family history of pre-eclampsia	98	28.5

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	Autoimmune disease	52	15.1
	Mother too small for her gestational age	47	13.7
	Total	**344**	**100**
5	**What are the complications of pre-eclampsia?**		
	Preterm birth	213	61.9
	Placental abruption	130	62.2
	Eclampsia	228	66.3
	Other organ damage	132	38.4
	Fetal growth restriction	82	23.8
	Cardiovascular disease	51	14.8
	Total	**344**	**100**

Table 4: Level of Knowledge on Pre-eclampsia

Knowledge	Frequency		Measure	Mean	SE	SD
	N	%				
Low (0–13)	213	61.9	26 points	12.34	0.176	3.273
High (14–26)	131	38.1				
Total	**344**	**100**				

The level of knowledge of the women in this study was computed on a 26-point rating scale and the distribution showed that there were 213 (61.9%) women who scored below average and had poor knowledge of pre-eclampsia. One hundred and thirty-one women (38.1%) had a high level of knowledge. The mean (SE) and standard deviation were 12.34 (0.176) and 3.273 respectively.

Health-Seeking Behaviors of Pregnant Women Towards Pre-eclampsia

The health-seeking behavior of women in this study was assessed with a 9-item scale. Only 70 (20.3%) women stated that they always visited a clinic for regular check-up during pregnancy while 240 (69.9%) occasionally did and 29 (6.3%) rarely did. A higher proportion (n = 209; 60.8%) of women reported to occasionally go for a screening once they notice any sign of pre-eclampsia. Only 6 (1.7%) women specified to always do that. Fifty-seven women (16.6%) stated that they did not perceive Preeclampsia to be a serious problem; hence, they did not seek health care. To the same statement, half of the women (50%) occasionally sought health care because they underestimated the risk of pre-eclampsia. Thirty-five women stated that they always treat the symptoms of pre-eclampsia with herbal medications while 133 (38.7%) occasionally did and only 20 (5.8%) stated that they never did (Table 2).

Distance of the health care facilities to the women's homes was seen as a reason by 23 (6.7%) women to always decide not to seek health care. One hundred and eighteen women (34.3%) specified that they occasionally had the same challenges and 25 (7.3%) never did. Twenty-six women (7.6%) reported that they always got drugs by themselves rather than go to the hospitals while 105 (30.5%) occasionally did and 200 (58.1%) rarely did. Over half of the women (190; 55.2%) stated that they could not afford the costs of treating pre-eclampsia, so they rarely went to the health facilities for check-up. Forty-one women (11.9%) specified that they did not practice this at all. Attitude of health care workers was a barrier to health care system utilization among pregnant women as 29 (8.4%) women stated that they always avoided going there

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because of this. One hundred and fifty-seven women (45.6%) rarely had such challenges and 96 (27.9%) never did (see Table 5).

Table 5: Health-Seeking Behavior of Pregnant Women to Pre-eclampsia

S/N	ITEMS	A	O	R	N
1.	I visit antenatal clinic for regular check-ups during pregnancy	70 (20.3)	240 (69.8)	29 (8.4)	5 (1.5)
2.	I go for screening once I notice any signs and symptoms of pre-eclampsia during my pregnancy	57 (16.6)	209 (60.8)	72 (20.9)	6 (1.7)
3.	I am not susceptible to pre-eclampsia and therefore do not need regularly seek health care	56 (16.3)	128 (37.2)	129 (37.5)	31 (9)
4.	I do not perceive pre-eclampsia to be a serious issue and therefore do not seek health care	57 (16.6)	172 (50)	86 (25)	29 (8.4)
5.	I treat symptoms of pre-eclampsia by taking herbal remedies	36 (10.5)	133 (38.7)	155 (45.1)	20 (5.8)
6.	I often do not seek health care due to distance of the health facility from my home	23 (6.7)	118 (34.3)	178 (51.7)	25 (7.3)
7.	I get drugs by myself rather than go to the health facilities	26 (7.6)	105 (30.5)	200 (58.1)	13 (3.8)
8.	I cannot afford the treatments of pre-eclampsia and therefore do not seek health care	31 (9)	82 (23.8)	190 (55.2)	41 (11.9)
9.	I dislike the attitudes of the health care workers; therefore, I reduce my visit and how often I seek for health care at this facility	29 (9.4)	62 (18)	157 (45.6)	96 (27.9)

Level of Health-Seeking Behaviors of Pregnant Women Towards Pre-eclampsia

The level of respondents' health seeking behavior was computed on a 27-point rating scale and the distribution showed that the health-seeking behavior was predominantly high among the women in this study. There were 120 (34.9%) women with a low level of health-seeking behaviors while 224 (65.1%) had a high level of health-seeking behavior for pre-eclampsia prevention and control. The mean (SE) and standard deviation were 14.93 (0.196) and 3.633 respectively (see Table 3).

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Table 6: Level of Health-Seeking Behaviors on Pre-eclampsia

HSB	Frequency		Measure	Mean	SE	SD
	N	%				
Low (0–13.5)	120	34.9	27 points	14.93	0.196	3.633
High (13.51–27)	224	65.1				
Total	**344**	**100**				

Table 7: Correlation Between Health Literacy and Knowledge of Pre-eclampsia

Variables	N	r	r^2	p
Health literacy vs knowledge	344	0.175	0.350	0.01

Table 8: Correlation Between Health Literacy and Health-Seeking Behaviors for Pre-eclampsia

Variables	N	r	r^2	p
Health Literacy vs Health-Seeking Behaviours	344	0.182	0.033	0.001*

DISCUSSION

This study examined the health literacy and knowledge of pre-eclampsia of pregnant women attending primary health care centers in Ikenne local government based on the combined use of the HBM and IMB models. Findings from this study revealed that the better the health literacy of the mother, the better her knowledge of pre-eclampsia and vice-versa. The importance of health literacy, particularly among women, is to increase access to information and services related to women's health, chronic diseases, and reproductive health, as well as to improve women's communication about their health decisions and take appropriate actions to implement those decisions (Putra, Prihatanto & Lestari, 2020).

The awareness of women on pre-eclampsia was high with the majority of the women reporting in the affirmative. However, responses to specific questions on risk, complications and symptoms was not consistent. Specifically, about two-thirds of the women could correctly identify that pre-eclampsia is a condition in which pregnant women have elevated blood pressure, proteinuria and swollen body parts. The knowledge of women in this study on these characteristics was different from reports from a study by Fadare, Akpor and Oziegbe (2016) in which women could adequately identify complications and symptoms. Evidence suggests that a thorough awareness of an illness aids in its prevention, control, and management since patient knowledge of the disease has been shown to improve patient compliance with therapy and reduce disease-related consequences (Howell, Harth, Brown, Bennett & Boyko, 2017).

The finding of this study showed that the level of good knowledge on pre-eclampsia was low among the women. This result is consistent with findings from Ethiopia (Mekie et al., 2021), Ghana (Joshi, Beyuo, Oppong, Moyer & Lawrence, 2020) and the United States (Wilkinson & Cole, 2018). Pre-eclampsia is a maternal condition with symptoms that stresses instant care. Adequate knowledge of the condition would make women report to hospital sooner, reduce

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delay in receiving care and have fewer negative outcomes. This stresses the importance of women having a thorough understanding of the disease.

Health-seeking behaviors of the women in this study were predominantly moderate with 65.1% of the women scoring above average. One of the primary challenges in combating pre-eclampsia is women's late reporting to health care clinics after experiencing a sign or symptom (Fondjo, Boamah, Fierti, Gyesi & Owiredu, 2019). A few women stated that they always treated the symptoms of pre-eclampsia with herbal medications. The use of herbal treatments for eclampsia had been documented in a study by Akeju et al. (2016) in Ogun State and another study by Oluyide, Keramarou and Grais in Jigawa State. This could have been because of the strong socio-cultural factors in these communities as well as desires for people to have control of their own health. Such practices however deter women from getting appropriate care and treatment. Cost of treatment was a notable factor for non-utilization of health care services when women experience signs of pre-eclampsia. Despite reports of free health care in Ogun State, pregnant women were reported to have not fully utilized health care services (Ajah, Ozonu, Ezeonu, Lawani, Obuna & Onwe, 2016).

Findings from the study revealed that the health literacy of women in this had a statistically significant relationship with their knowledge of pre-eclampsia. This shows that the higher the level of health literacy of the women, the higher their level of knowledge on pre-eclampsia would be. In addition, health-seeking behaviors to pre-eclampsia have a statistically significant relationship with health literacy of the women.

CONCLUSION

The association between health literacy and health-seeking behavior suggests that inadequate health literacy will limit utilization of health care services among pregnant women. The level of health literacy among pregnant women in this study may be improved, thus enhancing health-seeking behaviors. As a result, it is critical for health care providers to ensure that women understand the information they are provided about their health. Women with low health literacy may benefit from more information and practice better health-seeking behaviors.

FUTURE RESEARCH

Recommendations for future research is to increase the number of primary health centers included in the research and if possible include secondary and tertiary health institutions to provide a wider range of participants.

Recommendations for future research are to

- increase the number of primary health centers included in
- the research and if possible, the whole primary health care in
- Surabaya is covered, improve the questions for testing

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- knowledge of pre-eclampsia, and include other women
- who are not pregnant who also visit primary health centers
- to take part in answering questionnaires.

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